

Claims

- [c1] 1. A system for controlling a multiple cylinder internal combustion engine, the system comprising:
a feedback controller for controlling an output parameter to reduce a difference between a first desired output parameter value and an actual output parameter value; and
a control system monitor for generating a second desired output parameter value, determining a difference between the first desired output parameter value generated by the feedback controller and the second desired output parameter value determined by the control system monitor, applying a weighting factor to the difference to generate a weighted difference, and controlling the engine based on the weighted difference.
- [c2] 2. The system of claim 1 wherein the first and second desired output parameter values represent engine torque.
- [c3] 3. The system of claim 1 wherein the control system monitor estimates the second desired output parameter value based on at least engine speed, barometric pressure, and mass airflow.

- [c4] 4. The system of claim 1 wherein the control system monitor determines a weighting factor based on the difference between the first and second desired output parameter values.
- [c5] 5. The system of claim 1 wherein the control system monitor determines a weighting factor based on a ratio of the first and second desired output parameter values.
- [c6] 6. The system of claim 1 wherein the control system monitor determines a weighting factor based on a rate of change of the difference between the first and second desired output parameter values.
- [c7] 7. The system of claim 1 wherein the control system monitor determines a weighting factor based on a ratio of the first and second parameter values and a rate of change of the difference between the first and second parameter values.
- [c8] 8. The system of claim 7 wherein the control system monitor integrates the weighted difference, and selects an alternative control strategy when the integrated weighted difference exceeds a corresponding threshold.
- [c9] 9. The system of claim 1 wherein the control system monitor determines the second desired output parameter value by estimating the second desired output pa-

parameter value based on inputs from a plurality of sensors.

- [c10] 10.The system of claim 9 wherein the first and second desired output parameter values represent engine brake torque and wherein the inputs from a plurality of sensors include a mass airflow input and a barometric pressure input.
- [c11] 11.The system of claim 10 wherein the barometric pressure input is generated by a manifold absolute pressure sensor.
- [c12] 12. The system of claim 10 wherein the control system monitor generates a barometric pressure input using an inference based on throttle position, engine speed, cam position and measured airflow.
- [c13] 13.The system of claim 1 wherein the control system monitor implements an alternative control strategy when a statistical calculation based on a history of the weighted difference exceeds a corresponding threshold.
- [c14] 14.A system for controlling a multiple cylinder internal combustion engine having an electronically controlled throttle valve to modulate intake air in response to a control system parameter, the system comprising:
a controller having control logic for determining a de-

sired engine torque, determining an actual engine torque, determining a difference between the desired and actual engine torque, applying a weighting factor to the difference to generate a weighted difference, and selecting one of first and second engine control strategies based on the weighted difference.

- [c15] 15.The system of claim 14 further comprising:
at least one sensor for providing a sensor signal indicative of a current engine or ambient operating condition in communication with the controller, wherein the controller determines an actual engine torque by estimating actual engine torque based on the sensor signal.
- [c16] 16.The system of claim 15 wherein the at least one sensor comprises:
an engine speed sensor, a mass airflow sensor, and a pressure sensor in communication with the controller.
- [c17] 17.The system of claim 14 wherein the controller determines the actual engine torque using a monitor to measure engine brake torque.
- [c18] 18.The system of claim 14 wherein the controller retrieves the weighting factor from memory based on a percentage difference between the desired engine torque and actual engine torque and based on the rate of

change of the difference.

[c19] 19. The system of claim 18 wherein the desired engine torque and actual engine torque correspond to engine brake torque.

[c20] 20. A computer readable storage medium having stored data representing instructions executable by a computer to control a multiple cylinder internal combustion engine having an electronic throttle control system, the computer readable storage medium comprising:
instructions for determining a desired engine torque parameter for use by the electronic throttle control system;
instructions for monitoring the desired engine torque parameter by determining an actual engine torque based on current engine and ambient operating parameters;
instructions for determining a difference between the desired and actual engine torque;
instructions for determining a weighting factor based on the difference and a rate of change of the difference;
instructions for applying the weighting factor to the difference between the desired and actual engine torque to determine a weighted difference; and
instructions for controlling the engine in response to the weighted difference.